Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 6A. This sheet, which includes Figs. 6A and 6B, replaces the original sheet including Figs. 6A and 6B.

Attachment: Replacement Sheet

REMARKS/ARGUMENTS

Claims 1-17 were pending in the present application. The present response amends claims 14 and 15, leaving pending in the application claims 1-17. Reconsideration of the rejected claims is respectfully requested.

I. Allowable Subject Mater

Claim 15 (erroneously listed as 14 on the cover sheet) is objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 15 has been rewritten in such form, such that claim 15 should be in condition for allowance. Applicants therefore respectfully request that the objection to claim 15 be withdrawn.

II. Amendment to the Specification

The specification has been amended to specifically include language that was included in claims 4 and 5 as filed. As such, the new language does not add new matter. Applicants therefore respectfully request acceptance of the newly presented language.

III. Objection to the Drawings

Fig. 6A is objected to for the misspelling of the word "Arriving" in the header. A replacement figure is attached herewith that corrects the inadvertent typographical error. The changes to the Figure are not intended to alter the scope of the invention or be interpreted as a limitation on the claimed invention. Applicants therefore respectfully request that the objection to the Figure be withdrawn.

IV. Objection to the Claims

Claim 14 is objected to as containing an informality. Namely, claim 14 refers to step (c) of claim 12, while the limitation of "varying said pulse-repetition frequency" is actually contained in step (d). As amended, claim 14 should no longer contain the informality to which the Examiner objected. Applicants therefore respectfully request that the objection to the claim be withdrawn.

V. Rejection under 35 U.S.C. §112

Claims 4, 5, and 17 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. In particular, claim 4 is rejected for reciting "said resonator length is varied continuously," and claim 5 is rejected for reciting "said resonator length is varied incrementally." It is stated on page 3 of the Office Action that the specification fails to disclose these varying techniques.

As recognized in the Office Action, the specification discloses methods for varying the resonator length. For example, the specification teaches operating a PZT device to position a resonator mirror or a galvanometer including two rotatable plates to adjust the resonator length (p. 6, lines 3-21; p. 13, lines 23-30). The limitations of incremental and continuous adjustments were contained in claims 4 and 5 as originally filed, and corresponding language has been added to the specification. Since this language was in the application as originally filed, it does not add new matter to the specification.

Further, methods for driving a PZT device, galvanometer, or other device to accomplish incremental or continuous position adjustment are well known in the art, such that one of ordinary skill in the art could alter the length of the resonator either continuously or incrementally without undue experimentation. As such, Applicants respectfully submit that the claims are enabled and request that the rejection of the claims be withdrawn.

VI. Rejection under 35 U.S.C. §103

Claims 1-3 and 7-11 are rejected under 35 U.S.C. §103(a) as being obvious over *Holsinger* (US 5,367,529) in view of *Kane* (US 5,754,292) and *Ball* (US 4,896,324). Applicants' claim 1 requires a cross-correlation method for laser pulses, defined by:

> (a) **providing first and second repetitively pulsed laser resonators** delivering first and second pulse trains at **respectively first and second pulse repetition frequencies**;
> (b) **directing said pulse trains to spatially overlap on a detector**, said detector providing a response when a pulse of said first pulse train temporally overlaps a pulse of said second pulse train, said detector response having a magnitude dependent on the degree of temporal overlap of said pulses;
> (c) varying the optical length of said first laser resonator to change said temporal overlap between the pulses; and
> (d) during step (c) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses

(*emphasis added*). Such limitations are neither taught nor suggested by the cited references.

The Office Action states that *Holsinger* does not disclose recording the magnitude of response of the detector at different degrees of overlap, or disclose varying the optical length until first and second repetition frequencies are equal. Further, *Holsinger* is directed to a system for synchronizing pulsed laser systems so that the fundamental repetition frequencies are "effectively synchronized with one another," but for up to 1 picosecond of "jitter" over time between the synchronized signals (col. 1, lines 8-14; Abstract). *Holsinger* does not teach or suggest providing first and second laser resonators delivering pulse trains at first and second pulse repetition frequencies, but instead uses a single synchronized frequency. As such, *Holsinger* cannot render claim 1 obvious.

Kane does not make up for the deficiencies in *Holsinger* with respect to claim 1. *Kane* discloses a system for measuring the intensity and phase of a light pulse, wherein a single light pulse is split into a probe pulse and a variably delayed pulse that acts as a gate pulse (col. 3, lines 24-34; col. 4, lines 54-62). A single laser source is used (auto-correlation, not cross-correlation), such that *Kane* also fails to teach or suggest providing first and second laser resonators delivering pulse trains at respective first and second pulse repetition frequencies. Further still, *Kane* is directed to solving a very different problem from *Holsinger*, such that there would be no motivation to combine the two references. As such, claim 1 cannot be rendered obvious by *Kane*, either alone or in combination with *Holsinger*.

As recognized in the Office Action on page 5, *Ball* teaches controlling the cavity lengths of coupled laser resonators "in order to ensure that they are locked at the same frequencies." Such teaching does not make up for the deficiencies in *Holsinger* and *Kane* with respect to claim 1, as none of these references, alone or in combination, teaches or suggests providing first and second repetitively pulsed laser resonators delivering first and second pulse trains at respectively first and second pulse repetition frequencies as required by Applicants' claim 1. As such, claim 1 and dependent claims 2, 3, and 7 cannot be rendered obvious by *Holsinger*, *Kane*, and *Ball*.

Applicants' claim 8 also requires providing first and second repetitively pulsed laser resonators delivering first and second pulse trains at respectively first and second pulse repetition frequencies, such that claim 8 and dependent claims 9-11 cannot be rendered obvious by *Holsinger*, *Kane*, and *Ball*.

Claim 6 is rejected under 35 U.S.C. §103(a) as being obvious over *Holsinger* in view of *Kane* and *Ogawa* (US 6,819,428). Claim 6 depends from claim 1, which is not rendered obvious by *Holsinger* and *Kane* as discussed above. *Ogawa* is cited as teaching the use of a two-photon absorption medium as a detector where two laser pulses overlap, but such teaching still fails to make up for the deficiencies in *Holsinger* and *Kane*, as none of the references alone or in combination teaches or suggests all elements of Applicants' claim 1 as discussed above. As such, claim 1 and dependent claim 6 cannot be rendered obvious by *Holsinger* in view of *Kane* and *Ogawa*.

Claims 12-14 and 16 are rejected under 35 U.S.C. §103(a) as being obvious over *Kane* in view of *Ball*. Applicants' claim 12 requires an auto-correlation method for laser pulses, defined by:

> (a) **providing a repetitively pulsed laser resonator delivering a train of pulses having a pulse repetition frequency, said pulse repetition frequency being selectively variable;**
> (b) optically dividing each pulse of said pulse train into first and second pulse components;
> (c) directing said first and second pulse components along first and second paths onto a detector, said second path being longer than said first path, said detector providing a response when a said first pulse component temporally overlaps a said second pulse component on said detector, said detector response having a magnitude dependent on the degree of temporal overlap of said pulse components and;
> (d) **varying said pulse-repetition frequency to change said temporal overlap between said pulse components**; and
> (e) during step (d) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses

(*emphasis added*). Such limitations are not rendered obvious by *Kane* and *Ball*.

As discussed above, *Kane* splits a light pulse into probe and gate pulses, wherein the gate pulse is sent to a variable delay element. *Kane* does not vary a pulse repetition frequency of a pulsed laser resonator as required by Applicants' claim 12, but instead uses the variable delay element to produce a spectrum that is a function of the time delay of the probe pulse to produce an intensity plot vs. frequency and delay (col. 5, lines 12-18). As such, *Kane* cannot render obvious Applicants' claim 12.

Ball does not make up for the deficiencies in *Kane* with respect to claim 12. *Ball* is cited as teaching a method for changing the cavity length of a resonator, but since *Kane* uses a single resonator and only wants to modify one of the pulses after splitting (changing the cavity length would modify both the probe and gate pulses), there would be no motivation to use such a teaching in the system of *Kane*. Further, there is no teaching or suggestion that a variable length

resonator that would modify the probe and gate pulses could work in the system of *Kane*. As such, claim 12 and dependent claims 13-14 and 16 cannot be rendered obvious by the combination of *Kane* and *Ball*.

Applicants therefore respectfully request that the rejections with respect to claims 1-14 and 16-17 be withdrawn.

VII. Amendment to the Claims

Unless otherwise specified, amendments to the claims are made for purposes of clarity, and are not intended to alter the scope of the claims or limit any equivalents thereof. The amendments are supported by the specification and do not add new matter to the specification.

VIII. Conclusion

In view of the above, it is respectfully submitted that the application is now in condition for allowance. Reconsideration of the pending claims and a notice of allowance is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-1703, under Order No. COHL-5070. **A duplicate copy of the transmittal cover sheet attached to this Response to Office Action Mailed August 24, 2005, is provided herewith.**

Respectfully submitted,

STALLMAN & POLLOCK LLP

Dated: November 4, 2005

By: _____
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